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A detailed illustration of a raspberry plant. It features several green, serrated leaves and several five-petaled flowers with yellow centers. Several ripe, red raspberries are shown on the stems. The illustration is rendered in a classic, slightly stylized manner with green leaves and red fruit on a light tan background.

GROWING *SMALL FRUITS*

IN THE *PRAIRIE PROVINCES*



Prairie Provinces Collection

	Page
HORTICULTURE	3
FOREWORD	3
INTRODUCTION	5
CONDITIONS REQUIRED	6
Shelter	6
Irrigation	7
STRAWBERRIES	7
June-bearing Varieties	8
Everbearing Varieties	9
Field Management and Cultural Methods	10-20
Pests	20-21
RASPBERRIES (Brambles)	21
Red Raspberries	21-23
Black Raspberries	23
Other Brambles	23-24
Field Management and Cultural Methods	24-32
Pests	32-33
BUSH FRUITS	33
Red Currants	34-36
White Currants	36
Black Currants	36
Clove Currants	36
Gooseberries	37-38
Field Management and Cultural Methods	38-44
Pests	44-46
BLUEBERRIES	46
CRANBERRIES	47
SWEETBERRY HONEYBUCKLES	47
PERNNIAL	47
SASKATOONS	48
SILVER BUFFALONBERRY	48
AMERICAN ELDER	49
RUSSIAN MULBERRY	49
HAZEL (Filbert)	50

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GROWING SMALL FRUITS IN THE PRAIRIE PROVINCES

By

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LINE ELEVATORS FARM SERVICE

763 Grain Exchange Building

WINNIPEG, MANITOBA

March, 1945



Sparta Strawberry

—Photo by Dr. C. H. Goshen.

*The hand divine, with a less partial care,
Might well have fixed a fainter crimson there.*

—Sheridan

FOREWORD

LINE Elevators Farm Service are greatly privileged in being enabled to offer another useful and informative bulletin to the agricultural public. The author, Mr. W. R. Leslie, has won a high and well deserved reputation as a horticulturist. The "Morden Station", to which Mr. Leslie has devoted his life, is known the world over for its pioneer work in the breeding and culture of fruits, flowers, shrubs and vegetables.

The recommendations respecting varieties and culture are not nearly so specific or definite as are those to which we have become accustomed in connection with field crops. The reason for this is simply that the necessary knowledge does not, too frequently, exist. Largely as a result of public demand, the wisdom of which we do not propose to question, public funds for agricultural work have been directed largely toward the solution of field crop and livestock problems. Horticulture has been looked upon as a frill or as mere froth on the agricultural beer. We have no hesitation in asserting that this all too prevalent attitude is wrong, and we hope that the contents of this bulletin may help to hasten a change of the public heart.

The subject matter is confined to "small" fruits; but we hope that, in the not too distant future, we may offer an equally useful manual on tree fruit culture.

K. W. NEATBY,
Director,
Line Elevators Farm Service.

GROWING SMALL FRUITS IN THE PRAIRIE PROVINCES

W. R. LESLIE

INTRODUCTION

PRAIRIE pioneers refreshed themselves on native fruits found ripening in and about the wild thickets and along streams. Over much of the plains country, the native edible fruits were berries. Prominent were strawberries, raspberries, gooseberries, currants—red and black, perrubina or highbush cranberries, taskatoons and buffaloberries. Three kinds of cherries were widely distributed, the pincherry, chokecherry and the sandcherry. In southern Manitoba the collection was enriched by two species of wild plum and the Frost grape. In northern territory, where the soil was acid in reaction, true cranberries, and blueberries were gathered. Another northern berry of use was the sweetberry honeysuckle. Some early settlers used the fruits of the Scarlet Elder and of the Shrew Mountain Ash for jelly making.

It is fortunate that home makers found such a wide range of fruits in this new virgin land. It gave keen assurance that they could succeed in cultivating wholesome fruits in their own cottage gardens. The discussion that follows aims to supply general guidance in establishing and maintaining small fruits in the prairie home garden. Anyone wishing fuller treatment of the subjects is referred to two excellent books:—

SMALL FRUIT CULTURE.

By Dr. J. S. Shoenmaker, Professor of Horticulture,
University of Alberta, Edmonton, Alberta.

Published by F. Bickleton's Son & Company,
Philadelphia, Pennsylvania.

HARDY FRUITS.

By Dr. C. F. Patterson, Professor of Horticulture,
University of Saskatchewan, Saskatoon, Saskatchewan.
Published by the author.

Small fruits have appeal in that they soon come into bearing. The space required for their culture is not large. In most cases they may be grown conveniently, in conjunction with the vegetable garden. Plants of small fruits bring benefit to the garden by aiding in causing early winter snowfall to be trapped. There is a continuous market for any surplus crop. Strawberries and raspberries rate as favourite dessert fruits with most people. Bush fruits are popular as a source of jams, invigorating fruit drinks, and of sprightly jelly.

Gratitude is expressed to those persons and officials who have contributed pictures for these pages.

CONDITIONS REQUIRED

IT is necessary to provide deep, mellow, fertile soil, an effective shelter and it is advantageous, especially in the drier areas, to have available a supply of water to perform irrigation in prolonged spells of hot dry weather. Equipment to combat insect and disease pests by spraying or dusting is essential, and the choice of varieties that are winter hardy and resistant to disease demands careful attention.

SHELTER

A tree shelterbelt is necessary for success in the culture of small fruit on the prairies. Information on its planting and maintenance may be secured from the Dominion Forest Nursery Stations. The tree belt must be dense and have live branches close down to the ground. The belt may extend on all sides of the garden. If one side be open, it should be the east. Even where the fruit garden is on sloping land it needs the benefit of shelterbelts.

The tree shelter modifies the force of the wind, thus lessening its drying effect and avoiding undesired snowdrifts. It is desirable to provide a snow trap planting on the north and west sides so that the heavy drifts form outside the fruit area. Snowdrifts over the fruit bushes and canes may cause loss from mechanical breakage of the stems.

The shelterbelt causes little 'local climates'. Much of the wind is diverted upwards and over the top of the trees. Wind velocity is calculated to be retarded fifty per cent, or more, at a distance equal to ten times the height of the windbreak on the leeward side. The effect is essentially similar on the windward

side to a distance of about three times the height of the wind break. Pools or islands of quieted air form at either side of the well grown shelterbelt. Here the air is relatively calm. The result is that in these areas of modified climate, there is a change in humidity, velocity of air movement, and to some extent in temperatures.

Other things being equal, loss of moisture is directly in proportion to the speed and force of the wind. The shelterbelt tempers the winds throughout the year. It lessens the burning hot winds of summer and the biting cold winds of winter. In the spring the bees and insects work on the fruit bloom much more freely because the fruit bushes and plants are in a sheltered nook.

IRRIGATION

Irrigation is of value second only to the tree shelterbelt in the prairie fruit garden. Thousands of prairie farmers are impounding a supply of precious melted snow water in dugouts and behind dams. Such farmers can succeed with small fruits to high degree as they are able to saturate the earth in the root zones of the plants whenever the soil becomes unduly dry. Water is the first food required by berry plants and bushes. Moreover, they need a great deal. Generally it is lack of soil moisture in mid-summer or in late autumn that causes failure of the berry crop.

STRAWBERRIES

WILD strawberries are found far and wide across the prairies. These fruits possess the choicest flavour. However, very few of the native selections are suitable for cultivation. The berries are small in size and soft in texture. The plants tend to produce new runner plants so profusely that a dense mat of herbage soon develops.

The commercial varieties have come from two species native to this continent. These are the common Meadow Strawberry, and the Beach Strawberry which grows in the Pacific Coast region. The former was exported to Europe before the Beach was taken over in 1714 by a French officer. Europeans crossed these two and the first large firm-fruited strawberries were secured. The improved cross-bred plants were brought back to America and a great deal of further improvement has been accomplished.

In 1898 the first 'everbearer' was discovered and named Pan America. In standard varieties, fruit buds are formed in late September or October. In this new strain a second season of fruit bud formation occurs in late May and June. The happy result is that these plants produce an autumn crop as well as a June or early summer crop. This habit of producing an autumn crop makes the everbearing varieties popular for the home garden.

Among the varieties mentioned below, one, the Burgundy, produces 'imperfect' flowers. That is they lack stamens to function in producing pollen. Such varieties require to be planted adjacent to another variety which will furnish strong pollen for both varieties. It is well to have every third or fourth row set to a variety which carries perfect flowers.

The strawberry is the most highly prized and most widely grown of Canadian small fruits. The remark of Dr. William Butler is often repeated:—"Doubtless God could have made a better berry but doubtless God never did."

Most varieties grown in the Prairie Provinces are of recent development.

JUNE-BEARING VARIETIES

BURGUNDY

Burgundy was originated by the Minnesota University Fruit Breeding Farm in 1842. It is a cross, Easy Picker x Duluth. Plants are vigorous with healthy foliage, and long erect stems. Fruit is large, dark red, wedge-shaped, firm, late in ripening, and of excellent quality. The flowers are imperfect, so this variety must be planted adjacent to a perfect flowered variety to insure pollination.

DUNLAP

Senator Dunlap developed by J. R. Reasoner, Urbana, Illinois, about 1890. Plants numerous, vigorous, productive. Fruit is large, midseason, round conic or elongated, glossy, light and dark scarlet; flesh red, firm, pleasant flavour, quality good; seeds large, sunken.

GLENMORE

A seedling introduced by Wm. Oakes, Miami, Manitoba in 1942. Plants strong, very hardy, numerous, long flower stems, healthy foliage. Fruit medium to large, round conic, medium red, midseason, good quality for dessert and canning.

PRAIRIE BELLE

Prairie Belle originated with Mrs. E. R. Carey, Kipling, Saskatchewan. Plants vigorous, producing many runners. Fruit medium size, midseason, conic to wedge-shaped, glossy, bright red; flesh bright red, quality medium; seeds prominent.

PARADE

Howard 171 produced by A. B. Howard, Reichertown, Mass. in 1909. The parents were Crescent x Seedling of Howard. Plants of moderate vigour, somewhat prone to disease in Manitoba, hardy with erect stems. Fruit is medium size, long conic, bright red, medium firm, early, quality good.

EVERBEARING VARIETIES

GEM

Gem was selected from a field of Progressive variety by F. J. Kaplinger, Farwell, Michigan, named in 1933. Plants are hardy, vigorous, with many runners, healthy, with medium short sloping stems, productive fruit is medium to large, round conic, bright red. Gem gives a considerable late summer crop the first year.

SPARTA

Sparta introduced by A. J. Porter, Parkside, Saskatchewan, 1941. Parents were Gem x Fairfax. Plants are very hardy, strong growers, numerous, flower stems short and sloping. Foliage thick, glossy, usually free from disease. Fruit medium to large conic, full red, firm, later than Gem, quality good, being superior to Gem but bearing less abundantly.



FIGURE 1.—Gem, the most widely planted everbearing strawberry on the Canadian prairie. Photographed at the Dominion Experimental Station, Southern, Saskatchewan, in September, 1944.

WAYZATA

Wayzata introduced by H. Rockhill, Conrad, Iowa in 1918, as the Rockhill. It is derived from the cross Progressive x Early Jersey. The variety has more recently been distributed on the northern plains under the name Wayzata. Under irrigation the plants are vigorous and productive. In Manitoba, without irrigation, they lack vigour and make few new plants. The foliage is resistant to disease. Fruit is large, round conic, rich dark red, and of highest quality. Wayzata is esteemed as a parent of new varieties with fine flavour and healthy foliage.

FIELD MANAGEMENT AND CULTURAL METHODS

Site

The area chosen for strawberries must be moist but well drained. The plants will not survive if water lies on them. A gradual slope is best. Low spots are avoided, as cold air settles into such pockets. Such places tend to have blossoms injured by late spring frosts. Northeastern slopes may prove best where irrigation is not practised. Southwestern slopes make for early crops but are subject to damage by hot drying winds.

Soil

Strawberries may be expected to thrive on any good soil suited to grain production. Loams are preferable to sandy or stiff gumbo soils. The humus content is much more important than is the soil type. The plants are herbaceous with dense shallow roots. They require much moisture and a goodly supply of plant food. Choosing an area that is 'fat' with humus prepares for these needs.

PREPARATION OF THE SOIL

Land that has been in summerfallow or in hoed crops is desirable. This assures freedom from grass and weeds and should contain a reserve supply of soil moisture. In the autumn apply about forty tons of partially rotted manure per acre. Plough this under deeply, preferably to a depth of eight to ten inches. The surface is left rough until spring. As soon as the topsoil dries in April, it is disked, harrowed and rolled. This retards evaporation and offers a level pulverized surface for marking and planting.

If the land has been in sod, it is best to grow a hoed crop on it before planting to strawberries. Otherwise there is likely to be trouble from white grubs. Moreover, sod land is usually low in moisture.

PLANTING DISTANCE

For the prairie farms, rows are four feet apart, and the plants set one and one-half feet apart. To furnish an acre, 7 260 plants are required. Some growers narrow the rows to three and one-half feet. Plants may be set farther apart in the row when using prolific runner-bearing varieties such as Dunlap.

The above remarks relate to the matted row system. The runners are permitted to set new plants at distances of six inches or more from neighbour plants until a matted row is formed about two feet wide.

In the hill system, plants are set twelve inches apart in rows three to three and one-half feet apart. No runners are allowed to form. However, the hill system is not adapted to prairie gardens. The plants, being six months old when winter arrives, are likely to experience some root injury from winter freezes. There are then no vigorous young plants to take their place.

PLANTING STOCK

Considerations are choice of adapted varieties, early delivery of well packed stock, well grown young plants, as expressed in numerous long bright creamy coloured roots, and a clean ball of heath.



FIGURE 3—Strawberry planting stock. The three to the left are weakly rooted and poorly developed. They are to be discarded. The plant at the right is a good specimen. Therefore planting there remains the pruning off of all but the two youngest healthy leaves.

—Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario

Stock purchased from trained nurserymen may be expected to come trimmed ready for planting. If the ground be not ready for immediate planting, the bundle is unwrapped and the plants heeled-in in a sloping trench. This trench is in a sheltered shady spot in the garden. The plants are set one layer thick so that all the roots will be covered with moist soil, but the crowns and leaves remain uncovered. Usually the soil is moist in early spring. If it be on the dry side, water thoroughly when the trench is about two-thirds full of earth. Later, firm the earth and complete the filling.

If home grown plants are used, carefully dig sturdy plants that are young and uncrowded. Old plants have black or darkened roots and should be discarded as they lack vigour. Trim off all but two of the youngest leaves and cut off runner ends. Some growers cut back the roots about one-third, but this is thought now to be of no benefit though it is better to trim back extra long roots than to plant them with the ends turned upwards.

SETTING THE PLANTS

The time is as early in the spring as possible. Late April is preferable to early May. Early May results in a better



FIGURE 1. Planting the strawberry plant. Central plant, with the middle of the crown at the soil line, is correctly set. Left, too shallow, right, too deep.

Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario.

developed patch then comes from mid-May planting. In moist seasons, a planting made in mid-August may give fair results. Mid-September planting is likely to fail.

Planting may be done with a trowel, dibble, hoe, shovel, or plough and shovel. Probably the shovel or spade is most satisfactory. Two persons work together. One pushes the tool down eight to ten inches, then pushes it back and forward in the mellow earth to make a cavity. The shovel is then pushed forward and the plant roots swished in the hole so that they fan out against the firm side of the hole.

The depth of the plant is exactly such that the middle of the crown will be even with the surface after the earth has settled. The shovel is withdrawn over the edge of the toe, then inserted a few inches farther out and the soil pushed against the plant roots. More earth is added and thus firmed against the roots with the back of the boot heel. The depth of planting is vital. If set too deeply the crowns smother, if the plants are set so high as to expose the roots, they dry out.

CARE OF THE PLANTS

The roots must be moist at all times. The common method is to carry the plants to the planting in a piece of moist burlap which may be placed in a basket or pail. This is convenient and prevents the delicate rootlets drying in the sun and wind.

CULTIVATION

Cultivation begins as soon as planting is finished. It may be fairly deep for a month and close to the plants. If soil is turned onto the plants, it should be promptly removed. Later cultivation is not to be deeper than two inches. At no time should weeds or grass be allowed to get established. Cultivation is maintained until autumn. The width of the rows will be limited to five plants, or twenty-four inches.

MANAGEMENT

Flower stalks are to be removed promptly. If such grow before the new plant is well established they drain the vitality from the plant and delay runner formation. The exception is with everbearers, such as Gem. Flower stalks may well be permitted to form and develop after early July. These will produce a late summer crop of berries.

As the runners develop, they are held in the desired position by placing a small clod of earth on the vine near its end. The runner is nipped off when the young crown has begun to form. An extension from this would weaken the first young plant. It is important that the plants be at least six inches from their neighbours. Moreover, the matted row should not range over a greater width than two feet, which means it should not be more than five plants wide. This means two plants to each side of the mother plant. Extra runners along the outside of the rows may be cut off with a circular knife or rolling cutter attached to the cultivator. Surplus plants and runners in the row are hoed out. Where plants are permitted to set without restraint, a dense carpet may form, which results in small berries and a short season of harvest.

CAUSE OF MIS-SHAPEN BERRIES

Poorly shaped berries, or nubbins, may result from two causes. Cold winds is the more common. The other cause is faulty pollination, due to rainy weather or the bees and other insects not working freely on the blossoms. To prevent this trouble, the much is left on the patch to delay the flowering season, and varieties are chosen which produce much viable pollen.



FIGURE 4—White currants being carried from the field to the packing room. Dominion Experimental Station, Brandon, Manitoba. (Various kinds of frames may be used as carriers.)

PICKING

The berries usually are ready for first picking the third week of June. Harvesting is done every second day and may continue three to five weeks. Early in the morning, while the fruit is cool, is the most favourable time. The thumb and one finger are used to sever the stem close to the red berry. This leaves the hull and a short piece of stem on the fruit. If the picker pulls or jerks the berry, the hull is removed and the bald berry is more perishable. As soon as a quart box is filled, it is removed to the shade for cooling. For convenience in carrying the crop to the storage shed, a box carrier may be made of light lumber with handles running lengthwise, and of a size to accommodate eight or more boxes.

YIELD

Under good conditions an acre may yield 4,000 quarts. The average runs about 1,500 to 2,000 quarts. The amount of crop is dependent upon a number of factors such as fertility of soil, weather—particularly rainfall, the variety, the evenness of stand, freedom from insect and disease pests, and protection from such birds as robins, catbirds and waxwings.

PLANTING

The plants are to be kept six inches or more from one another. Under dry conditions a narrow matted row, with plants eight inches apart, is preferred.

IRRIGATION

A continuous supply of soil moisture is the chief deciding factor in securing a satisfactory crop of strawberries in the prairie garden. Dry weather soon after planting may result in a spotty stand of plants. Drought during the ripening period tends to small berries and a light and short harvest. The practical assurance against such disappointment is found in irrigation. This is a reason for establishing the plantation near the farm dugout or dam. The surface of the land should be relatively level and with a uniform gentle slope.

The easiest method of irrigation on the average farm is by a surface ditch. A headland furrow is run along the upper side. Connecting with this are furrows ploughed between the rows. Water is turned on in the evening and allowed to run until the amount absorbed is equal to two or three inches of rainfall. It

is well to irrigate every other row so that the pickers will have dry footing. The next irrigation will be given the alleys neglected before. Two days after watering, the soil is cultivated or straw mulch pulled over the water furrows.

Porous canvas hose is employed on small areas by some growers. The hose is laid along the ground and moved when the desired amount of water has been spread. The hose is to be cleaned and dried after use, or the fibre soon begins to rot.

Fortunate is the grower who has a pressure water system and who can use garden hose to water between the rows. If the leaves of the plants be wet during sunny weather, they are likely to scotch and die.

A supply of soft water for the strawberry patch is of utmost importance. Without facilities for irrigation, strawberry growing on most of the prairies is a distinctly risky venture. With water, adapted varieties and a generous mulch of clean straw for the winter period, a successful crop may reasonably be expected every summer.

MAINTAINING FERTILITY

It is good policy to enrich the soil before planting is done. By using rotted manure generously during the autumn ploughing, prairie soils should nourish the plants well for the year or two the plantation is at work. Some growers consider it profitable to apply 2 pounds of sulphate of ammonia to 100 feet of row as a side dressing in early May and to repeat the dressing again in early August. Others broadcast 200 pounds of ammonium phosphate (11-48) before the barn manure is ploughed in during the autumn the land is being prepared. However, most gardeners of the Prairie Provinces depend upon water for any extra feeding to be done in the strawberry patch. Generally the only apparent shortage will be found to be in the supply of soil moisture. Almost every season at least one good irrigation will prove helpful.

PROPAGATION

Plants increase by new plants forming on the runners that stretch out from the parent plant. If home grown nursery stock is to be used for the new plantation, special care is due the young plants. Only one plantlet is allowed to set on a single runner. It is given ample room, and watered when the soil dries. This attention is to induce development of a stout crown and a

sturdy growth of deep strong roots. Winter mulch is provided to prevent frost injury. The new plants are dug carefully and planted promptly in the new patch next April.

RENEWAL

A large proportion of prairie growers take one crop only from a patch and plough it down in late July, after harvest. On the other hand, some renew the patch and leave it down for two, or even three, summer crops.

To renovate, the excess mulch is raked off in late July. If mulch is scarce it may be saved and spread again in the autumn. Then the patch is mown or scythed closely but carefully so that the crowns be not bruised or cut. The plant tops are raked off and burned to lessen spread of disease. The centre of each old row is ploughed in with a narrow walking plough. This leaves a narrow strip of plants along the side of the row. New plants will soon develop over the old alley way, which will previously have been well cultivated up and made level. The old centre of the row, which has been ploughed, is promptly cultivated down level and is kept clear of plants, thus forming the new alley.

There remains the task of thinning the remaining plants. This is done with a hoe and to a spacing of about twelve inches. Old, weak and very young plants are removed. Strong new plants are retained to produce the next summer crop.

There are several modifications of this renewal of the patch. One is to narrow the old row by ploughing the sides to leave a twelve inch strip of plants down the original centre. This area of plants is cultivated and hoed to thin out old and weak plants.

Whatever method is adopted, it is necessary to thin out the plants. Otherwise the patch becomes a dense bed of herbage with too many, crowded, plants. Results, in term of harvest, are disappointing always.

Speaking generally, the most successful culture for the prairie garden appears to be that of taking only one crop from a planting. A new patch is set out each April. This makes for good berries, a minimum of weeds and diseases.

WINTER PROTECTION

Wild strawberry plants are usually found where there is some shelter from winds, grass or other plants growing near them. Such shelter traps the snow that falls, and this provides

the very best protection—a blanket of snow. Commercial varieties originate mostly from ancestors that grew farther south, or at the Pacific Coast. When even the local wild plants benefit from a covering of leaves and snow that accumulate early in the dormant season, it should be realized at once that commercial strawberries deserve protection from winter cold and winds.

In March, 1944, the University of Minnesota published bulletin No. 371.—“Winter Behaviour of Strawberry Plants” by Brierley and London. Among the observations and conclusions given are the following. Frosty nights in autumn prepare the plants for winter by checking growth and developing hardiness. Seldom is winter loss due to “ice smothering.” The mulch commonly becomes filled with ice but this causes no serious injury to dormant strawberry plants. The “danger point” for well-matured well-hardened plants lies close to 21° and the actual killing point lies close to 10°. Some varieties are considerably more hardy than others. As a group, fall-bearing varieties are less hardy than June-bearers. In the average winter, a good mulch provides adequate protection against too low temperatures, and an additional covering of snow makes protection more certain. Mulching at the right time is more important than the exact degree of cold resistance. Late mulching, or to delay until the temperature at the crowns beneath the leaves falls below 20°, may result

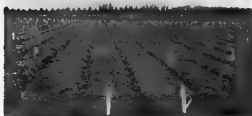


FIGURE 1. Strawberry patch mulched with wheat straw in October for winter protection.

—Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario.

in severe injury or killing. A series of light frosts will harden the plants, and mulching before severe freezing occurs usually will avoid serious injury. Plants mulched too early may continue to grow slowly. Leaves produced beneath the mulch are bleached and the plants do not harden. Such plants may be severely injured or killed at temperatures only a few degrees below freezing.

Mulching, it is seen, should be done before the ground is frozen hard enough to carry the straw wagon. The Minnesota specialists recommend spreading a light mulch of finely divided straw before mid-September in northern gardens. This sifts down below the leaves to protect crowns and roots from early hard night frosts. The balance of the three to four inches of mulch would be spread over the plantation by mid-October.

It is important that a maximum amount of the early snowfall be trapped, and maintained over the mulch. Spreading some brush, corn stalks or other litter over the early snow will be a help in attaining this objective.

In early May most of the mulch is removed. Sufficient is left to keep the berries off the soil. Some growers merely fork the surplus straw off the rows and into the alley between the plant rows. It assists in keeping down weeds and lessening evaporation of moisture from the soil. Under this practice, any summer cultivation is done by hand. Should weeds appear they are pulled by hand in the young stage.

The common mulch on the prairies is clean wheat straw. This should be free of grain and weed seeds. Marsh hay is highly esteemed, millet is fully satisfactory, and spruce boughs have given good results. The mulch material should be such that it will not pack down into a flat mat. A substance that settles down tightly over the plants is likely to cause smothering and mouldiness.

The depth of mulch should be about three inches when it has settled. This takes about three and one-half to four tons of straw per acre. By leaving the mulch unstirred until the first week of May, the season of blossoming is delayed somewhat. This means less danger of injury to the flowers from late spring frosts.

DURATION OF PLANTATION

The usual prairie practice is to plant in April, take off one crop the summer of the following year, and immediately plough.

down the area. Some plantations are left down another year to yield a second crop. Seldom will it prove profitable to maintain the plantation longer than the second July. An exception relates to overbearing types. They make fewer runners and may remain fruitful to the third season. Much depends upon the attention given to the plantation.

PESTS

Pests include insects, diseases and birds. The chief trouble in prairie plantations has usually been from diseases.

Insects

Seldom has insect damage been extensive. It is well to be on the lookout for the strawberry leaf roller, the strawberry weevil, the strawberry leaf beetle, cutworms and the strawberry root weevil. The first three are combatted by spraying or dusting with a stomach poison. This is usually arsenate of lead, used at the rate of 1½ to 2 pounds of the powder in 40 gallons of water as a spray; or 85 pounds of sulphur mixed with 15 pounds of arsenate of lead as a dust. Strawberries should on no account be sprayed or dusted with these poisons after the berries have begun to form. The last two insects are fed poisoned bait.

Should insects appear in alarming numbers, it is wise to send a specimen to an entomological laboratory, agricultural extension service, university, or an experimental station, for detailed guidance.

Diseases

Diseases often infest the strawberry plantation. Most common are leaf spot, leaf scorch, powdery mildew, and the virus disease known as xanthosis or yellow-edge. The first three are of fungus origin. The first two are fought with a spray of Bordeaux mixture 4-4-40* applied about the middle of May, and repeated in early June. Mildew is treated by dusting with sulphur as soon as noticed. Virus diseases are spread by insects. Infected plants are rogued out promptly and burned to prevent spread of the malady to other plants.

The best scheme is to avoid trouble by buying healthy plants, certified as being free of disease; choose varieties that possess resistance to the common strawberry disease organisms; plant

*Copper sulphate, 4 lb.; quick lime, 4 lb., water, 40 gallons.

on well drained, clean, fresh soil; and plough down the plantation as soon as it lacks in vigour and thriftiness.

Bugs

Birds, such as robins, catbirds and warwings may take considerable toll from the midsummer crop of ripening berries. Placing flat pans of water in or near the patch is thought to lessen their attack on the fruit. Stretching a line between posts across the patch and threading the lids and bottoms of bright tin cans at four to ten foot intervals tends to scare the birds from the patch. A sure method of protection is to spread tobacco cloth or cheesecloth over the rows or to erect a ceiling cover of one inch mesh chicken wire over the fruiting area.

RASPBERRIES (Brambles)

RED raspberries are inhabitants of coulees, ravines, and woodlands across Western Canada. Some gardeners cultivate local wild raspberry bushes. The results fall short of what may be had from named varieties. The wildlings usually make far too many suckers and are prone to suffer severely from virus diseases.

The origin of the commercial varieties is from select native seedlings and from European types. Most varieties prominent in nursery catalogues probably carry blood of both the American and the European species.

Black raspberries spring from native American plants.

Purple raspberries are hybrids between black and red types. They occur now and then in the woods. Named varieties have come chiefly from controlled crosses made by plant breeders.

The red raspberry crop is second only to the strawberry in our berry fruits. Blacks are less hardy as a rule and they require more work in training the canes. Recently there has been a considerable number of plantings made in prairie gardens. Purples are grown but little here.

RED RASPBERRIES

CHIEF

Chief originated at the University of Minnesota as a self-pollinated seedling of Latham. Introduced in 1927 as Minnesota 323, it was named in 1936. Plants are first rank in hardiness, moderately vigorous, and very productive. Fruit is medium size, round, light red, early and of good quality. A hardy dependable variety.

HERBERT

Herbert developed by R. B. White, Ottawa, Ontario, in 1887 thought to be a seedling of Clarke. Plants moderately vigorous, relatively hardy, and productive where thrifty. Fruit is large, obtusely conic, red, somewhat soft, quality good for home use.

INDIAN SUMMER

Indian Summer was bred at the New York Experiment Station, Geneva, New York and introduced in 1915. A cross bred Empire x Herbert mother was pollinated with Lloyd George. Plants are vigorous, relatively hardy, upright, productive and often bearing an autumn drop, thus the variety is classed as an everbearer. Fruit is large, round conic, bright red, medium firm but somewhat crumbly, sweet and of good quality.



FIGURE 4. A cross bred red raspberry seedling of promise.

Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario

LATHAM

Latham resulted from the cross King x London at the University of Minnesota Fruit Breeding Farm in 1908. Plants are strong growers, tall, nearly thornless, reddish with a heavy waxy bloom, and very productive. They are hardy in southern Manitoba and, with Chief, this variety is preferred by commercial fruit growers. Fruit is large, roundish conic, bright red, firm and of good quality. Season is late and extends over a period of several weeks.

RUDOL

Ruddy was produced by the North Dakota Agricultural College, Fargo, North Dakota. It is a hybrid selected from the cross Plant Farmer x Latham. Although derived from similar breeding as are purple cane raspberries, it bears suckers rather freely and is used as are red raspberries. Plants are moderately vigorous, spreading, somewhat harder than Latham, and valued for their tolerance of hot dry weather and for their resistance to red spider. Fruit is medium size, roundish, purplish red, rather soft, midseason, quality is fair for dessert, being somewhat tart, but very good when canned.

TAYLOR

Taylor originated at the New York Experiment Station, Geneva, New York, from a cross Newman x Lloyd George. Plants are very rank growers, erect, tender, requiring bending over for winter, productive. Fruit is very large, round conc., bright red, firm, and of top quality.

VIKING

Viking bred at the Horticultural Experimental Station, Vineland, Ontario, 1914, from the cross Curbbert x Mariboro, introduced in 1923. Plants are very vigorous, tall, erect, smooth canes, nearly as tender as Taylor, productive. Fruit is very large, conic, bright red, firm, sweet and of high quality.

BLACK RASPBERRIES

BRISTOL

Bristol was developed at the New York Experiment Station, Geneva, New York, 1934, from the cross Watson Prolific x Honeywaal. Plants are strong growers, relatively hardy but requiring protection in the Prairie Provinces through winter, healthy and productive. Fruit is large, roundish, shiny black, firm, sweet and of good quality.

DUNDAS

Dundas also from the New York Experiment Station, Geneva, New York. Introduced in 1927. Parents are Smith No. 1 x Palmer. It differs from Bristol in that the fruits are dull black, somewhat fewer, and the flavour has slightly less appeal.

OTHER BRAMBLES

PURPLE RASPBERRIES

Purple raspberries may be grown with fair success in the southern prairies. However there has been considerable despair from disease and winter injury. Most gardeners content themselves with red and black raspberries.

BLACKBERRIES

Blackberries are mostly too tender. Moreover, this rank-growing thorny shrub requires moist soil and, apparently, a moist atmosphere for successful cropping. A native form is found along the Rainy River. Its fruit is small and the bushes have been susceptible to disease under cultivation in Manitoba.

Dewberries

Dewberries of commercial strains are tender and not adapted.

Loganberries

This fruit was discovered by Judge H Logan, Santa Cruz, California, in 1881, growing in his garden. It is considered to be a red fruited seedling of the trailing blackberry that is found along the Pacific Coast. With much care in watering, trellising and completely covering it with soil through the winter season, some fruit may be secured in prairie gardens. However, as a practical crop it is 'out-of-bounds' in this climate.

Youngberry

Youngberry originated in 1905 with B. M. Young of Louisiana as a cross of the Phenomenal and the Mayes dewberry. The fruit is attractive, very large, dark purplish red, and of excellent flavour. The canes are still more tender than those of the loganberry.

Boysenberry

Boysenberry originated about 1930 with Rudolph Boysen, Anaheim, California. Vines and fruit resemble the youngberry. It has borne in Winnipeg, but it requires tender nursing and is considered merely as a novelty in local gardens.

FIELD MANAGEMENT AND CULTURAL METHODS

Site

The location suited to strawberries is also good for raspberries. A gentle slope so that water and cold air will drain off to lower land is desired. Northern and eastern slopes are less subject to drought than areas facing south and west. Low spots are to be avoided. Standing water smothers the feeder roots and causes their death.

Soil

Raspberries thrive on various soils that are sweet and free from alkali. Red raspberries do well on heavy clay but prefer clay loam. The blackcap raspberry dislikes cold soils and should be placed on loams or sandy loams. In all cases there should be a large amount of humus in the soil. All bramble fruits require much moisture. A deep soil rich in water conserving vegetable matter is a first necessity in their successful culture.

Preparation Of The Soil

Growing a hoed crop, such as potatoes or corn, the previous season is good preliminary culture. In the autumn, twenty to forty tons of partially rotted manure should be ploughed in deeply. In April the surface is disked and harrowed.

DISTANCES

In prairie gardens, it is well to have the rows eight feet apart. This allows much space for cultivation, for range of roots and for winter mulching. Where land is scarce and irrigation is employed, six feet between rows may be adequate. Plants are set three feet apart in the row, but they may be placed as close as one and one-half feet. When grown in hills the distances vary from 4 x 4 to 7 x 7 feet.

PLANTING STOCK

It is most important that only healthy plants be used. If purchased, get assurance that the stock is certified as free of disease. This consideration pertains particularly to virus diseases such as mosaic and leaf curl. Discard any plant carrying crown gall, which shows as rough swellings or knots on the roots near the crown. These plants are low in productivity, and, being poorly nourished, are subject to winter injury. Stout, vigorous, canes with a good growth of roots are selected. Weak plants are to be discarded. The old advice of the gardener "when in doubt, throw it out" applies in full force to raspberry growing.

SETTING THE PLANTS

The nursery plants are set out in earliest spring. Bramble fruits break their dormancy early. They should be placed in their permanent home before the end of April. They will be heeled in a sloping trench and covered with moist mellow earth if the stock has been shipped in before planting can be done. Plants are taken to the field in a big box containing moist moss or in a bucket one-third full of water. Small quantities are removed at a time and carried in wet burlap to the planters. The delicate roots should never be permitted to become dry in the sun and wind. If planting be performed on a windy day it pays to mud the roots by dipping them in a bath of clay mud made to the consistency of thick cream.

Planting is often done behind a shovel or spade, as outlined for strawberries. The depth should be one to two inches deeper than the plants were in the nursery row. A large roomy hole is desired. The earth is fairly well firmed by using the back of the heel. This wedges the earth against the roots and squeezes out any large air pockets that might have occurred.

Where a large plantation is to be set, the plants may be set in a deep furrow, made by ploughing twice in the same direction. Then the earth is ploughed back in the furrow and is firmed by driving the wheel of a car or light tractor down the row close to the center.

As soon as planting is completed the canes are headed back with secateurs, or a knife, to a height of four to six inches. This chore is essential to early establishment. The raspberry has not many roots when transplanted. New roots will be slow in developing if the whole cane be left intact.

Autumn planting of red raspberries has been satisfactory in the southern prairies in wet September. The plants should be set during the first ten days of September. This allows a sufficient period of warm weather to promote new root growth before the soil becomes cool. It is well to remember that most trees and shrubs continue making new root growth during early autumn even though all growth in the tops of plants has ceased. Black and purple raspberries are not adapted to autumn planting. If set in September they are subject to severe winter injury. Set them in earliest spring while the soil is cool and moist and their buds are still dormant.

CULTIVATION

The cultivator is used early to keep down growth of all other plants. From May to mid-July cultivation is shallow so that new roots be unmolested. If the ground is such that water is apt to be about the plants, a double furrow is run in October to form a drainage ditch. The soil is thrown towards the plants. In the spring this is cultivated back. Summer cultivation, in addition to killing weeds and filling cracks, is a pruning operation. It limits the width of the row of new plants. A stroke of the cultivator is given after each irrigation to loosen the topsoil.

MANAGEMENT

Clean cultivation is usually practised on the prairies. Cover crops are not considered suitable as they remove much moisture from the soil. In contrast, a mulch acts in the opposite manner and conserves moisture. It seems good policy to mulch every other row each year and cultivate the alternates. The next spring plough down the mulch. In the meantime, the cultivated row

would have been mulched in October. The mulch may consist of straw, old hay or manure. As this rots down, it will improve the soil especially if ploughed under.

MAINTAINING FERTILITY

Raspberries need to be kept in good vigour if they are to be profitable. Thick canes are more productive than thin ones. Stable manure, in generous amounts, may be applied during the winter with benefit. Ammonium phosphate, (11-48), at the rate of 100 to 150 pounds per acre, may prove helpful when scattered between the rows of bearing plants immediately before the last cultivation in mid-July. A good scheme is to test out the effect of artificial fertilizer on a small plot. If response is significant, an application is made on the whole field each year.

TRAINING AND PRUNING

There is some difference in the treatment of the red or suckering types, and the types with black and purple fruit which increase by tip layering.

Red raspberries increase by sucker growths. Fruit is mostly borne on canes of the previous year's growth. Having completed its second season, and produced fruit, the cane dies. As the cane that has fruited is of little, if any, further use to the plant, and moreover as it is weakening and likely to be a carrier of disease and of insects, it is pruned out immediately after fruit harvest, removed from the patch and burned. Such prompt removal also helps to conserve soil moisture.

The hedge row system is usually employed in private gardens. The hill system means more work and generally lower yields. The hedge row is restrained in width to about one and one-half to two and one-half feet by the cultivator. In the row the plants are allowed to increase freely the first year. The second year it may be necessary to thin out the plants by hoeing. If shelter be sparse, it may be wise to delay this thinning until early spring of the third year. This will mean a denser snow trap formed by the row during the winter season. Each subsequent season, thinning out of surplus young plants will be needed. The weak canes are cut out and also any surplus of strong ones. Sufficient stout canes are left to form five or six canes to a clump for a one and one-half foot portion of the hedge row. The canes should be well

spaced across the hedge row, preferably being at least six inches from any neighbour cane. That means that a cane will have ground area of six inches square, or more, on the average. If thinning be done in the fall a few extra canes per clump should be left to provide for winter losses from breakage. Surpluses will be cut out in April.

Supports are used to advantage where the canes are very tall or the plants are droopy in habit. A simple method is to place stout fence posts in the centre of the row at distances of ten to thirty feet. Connect these by stretching a wire of 15 gauge, or larger, down each side at hip height. The two parallel wires may be connected at intervals by cross wires or (twine. If small posts are used, it may be better to nail cross-arms of wood to the posts and fasten the wires to the ends of the arms. Supporting the canes keeps the fruit clean and lessens breakage.

Topping or heading back of red raspberry canes is popular with some growers. However largest yields may be expected from the unpruned. In the Canadian prairies, cutting back in autumn is disastrous. Early May is the time to operate on the tips of the canes. They are clipped at a height of about five feet.

Black and Purple Raspberries. Plant increase is by means of layers formed on the tips of the arching branches. As with the reds, the two-year cane dies soon after fruiting. It is pruned out as harvesting ends.

The difference is in pruning of the cane being trained for fruiting. The fruits are produced on new wood produced by laterals, or side branches that develop the previous year. Hence the young canes are topped or nipped back by the fingers, or by secateurs, or small shears, to encourage strong side branches. The topping is done when the canes are three or four inches longer than the heading back height. By removing a three or four-inch piece of the tip, canes with wider branches result than where only the terminal bud is nipped off. The height for heading black raspberries is eighteen to twenty-four inches and for purples twenty-four to thirty inches. The following spring, the lateral or 'side branches are shortened by shears to a length of six to twelve inches. From these, leafy shoots grow ending in a cluster of flower buds. The spring pruning is done in May as the buds swell. Then the gardener will be able to detect any branches that are winter killed and perform all necessary pruning at the same time.

IRRIGATION

A very large amount of water is taken from the upper two feet of soil in a raspberry plantation during midsummer. If weather be dry the picking season is likely to be short and the harvest disappointingly small. Great benefit then may be expected from surface irrigation. The water is applied freely in a series of open ditches run between the rows. Under drought conditions, a late October irrigation may bring the plants through the winter in more thrifty condition.

PICKING

Picking is best done in the cool of the morning. Raspberries are ready to harvest when the berry separates readily from the receptacle or core. The fruit is removed with the thumb and two fingers using the least possible pressure. Picking is done directly into a box. When the container is level full it is placed in the shade and as early as possible carried to cool storage. Where the canes are thorny, gloves from which the fingers have been cut off help to protect the hands. Red raspberries soon deteriorate, so picking is done frequently. Black raspberries are more durable. They ripen later than the reds.



FIGURE 1.—Tip covering raspberry canes in October to prevent winter injury

Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario

YIELD

A well established plantation of red raspberries may be expected to yield from 1,000 to 2,500 quarts per acre. Where growing conditions are favourable, black raspberries may give about twenty per cent more. However, few black varieties possess full hardiness. The highest yielding red varieties, such as Viking also tend to lack somewhat in hardiness. A plantation may be considered in full bearing in its fourth year. At that time one hundred plants should produce one hundred quarts of fruit a year.

WINTER PROTECTION

Commercial varieties of raspberries may suffer winter injury on the prairies. In the chanook area of southern Alberta it is necessary to cover the whole plant with three or more inches of soil. In Fruit Zone 1 of southern Manitoba the recommended varieties usually come through the winters in good condition without protection. Over the larger portion of the prairies it is considered best to bend over the canes, pinning the tips to the ground, to protect the fruit buds.

Winter injury may be so severe that the root is killed and the plantation ruined. Sometimes the canes are killed to the ground. In that case, new shoots may develop well so that only

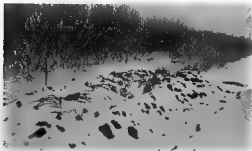


FIGURE 4.—Tip covering raspberry canes to prevent drying out and to trap melting snow. Dominion Experimental Station, Morden, Manitoba, December, 1943.

one crop is lost. Again, immature canes may kill back in the tips. Under other conditions the canes may survive but the flower buds be killed.

Where the roots are killed, it is likely due to sheer cold. If the soil becomes lower than 10°F, killing is probable. This rarely occurs. Opinion is held that most injury in the keen dry prairie air results from winter drying caused by the combined sun, cold and wind.

Recommendations include the selection of hardest varieties, encouraging early maturity of plants by concluding cultivation and summer irrigation in late July, limiting the amount of fertilizer in those districts where plants grow late, providing against winter drying by a heavy irrigation in October, bending over the canes in late October, and trapping a maximum amount of snow.

In bending over the canes, two men work together. One presses on the clump of canes with a four or five tine stable fork gradually raising the fork up the canes and down to one side until they are pinned to the earth. The second man shovels earth on the tips to weigh them down. Later a shallow furrow of soil may be ploughed over them. Uncovering is done at the end of April. The canes are freed by a fork. The soil is cultivated down level. In southern Alberta the plants must be completely covered with soil. The canes are bent forward along the row. Soil is ploughed up and smoothed over them. At the end of April the canes are lifted and the soil worked back into the furrows.

DURATION

A field of red raspberries may be expected to remain in good vigor for eight to ten years. Blacks usually require ploughing up in six to eight years. Much depends on the health of the plants, the freedom from grass and weeds, and the humus content of the soil. If the land becomes infested with grass it is ploughed up. The task of removing extensive infestations of grass and perennial weeds is not justified because a new plantation soon comes into bearing.

PROPAGATION

Brambles which sucker are increased by transplanting well developed stout suckers. In blackberries, suckers may be used, but commercial growers prefer root cuttings which have had one

season in a nursery row. Non-suckering types, such as black raspberries, are reproduced from tip layers. These may form naturally but hand work is helpful where the growing season is short and the weather dry. When the arching branch has formed clusters of small curved leaves on its somewhat flattened terminal, bury this tip in mellow moist soil two or three inches but not over four inches deep. The season is usually late August. Roots soon form. Next spring sever the new plant, leaving four to eight inches of the old cane. This 'handle' is left on until the new plant has been placed in the new plantation, then it is cut off. The plantlet may remain growing where it formed for another year, but usually it should be rooted sufficiently to move in April. In dry weather it may be necessary to wet the soil where the tip layer is forming during the month of September.

PESTS

INSECTS

Raspberry plants are subject to a number of insect pests but only one is a general problem in the Canadian prairies. It is the red spider. The little creature (not a true insect) is about one-fifteenth of an inch in length. The colour in summer is greenish or yellowish, in autumn, and on dying foliage, it may be red or brownish. It thrives in hot dry weather. Its presence is noticed by numerous tiny yellow dots on the leaves. These result from the mites sucking the juices from the underside of the leaf. Injury often shows in late June. The old mites like to winter under weeds. In early spring they climb the plants and egg laying commences. There may be as many as ten generations before freeze-up.

Raspberry foliage is very sensitive to poison spray injury. Red spider control consists in spraying the underside of the leaves with cold water, using a power sprayer, and destroying all weeds in the plantation. Using water at two hundred pounds pressure washes off many of the mites and the moisture causes disease to develop in their broods.

DISEASES

Diseases of raspberries are many. The most injurious on the northern Great Plains are the virus diseases, mosaic and leaf curl; the fungus disease, spur blight, and the bacterial disease, crown gall.

Mosaic shows up on new growth by the leaves being a lighter shade of green, later becoming mottled with yellow patches. The leaves tend to become puckered, and the plants dwarfed. Where not more than one plant in twenty is affected, rogue them out. Remove all plants and roots within six feet of the diseased subject. Inspect the plantation several times during the summer, commencing in early June. It is wise to use a kerosene torch on the bushes before digging. This is to destroy the aphids or plant lice which carry the disease to healthy bushes. Where the malady is widespread, destroy the whole field. Set out a new planting at least one hundred yards distance using stout healthy nursery stock.

With leaf curl, the foliage becomes much wrinkled, curled, and of dark green colour. Suckers from diseased plants are low and their leaves small. Any fruit produced is small, dry and seedy. This disease also is spread by plant lice. Control is as for mosaic.

Spear blight begins in early July. It is seen as dark red or chocolate brown spots on leaf stalks and on the bark of young canes. The discoloured areas may spread from the node, or bud, until they cover much of the circumference. The lower leaves may fall off. This disease weakens the plant and often accounts for extensive winter injury. The extent of infection appears to be connected with weather conditions. Control is by pruning out and burning old canes as soon as picking is finished, and by spraying with Bordeaux 3-6-40, to which has been added 2 pounds of resin fish oil to each 40 gallons, when the young plants are twelve inches high. Repeat this spray in two weeks.

Crown gall causes rough knobby swellings on the crown, root and lower canes. The bacterial organism enters the plant through wounds. Control is by avoiding any abnormal nursery plants, planting on soil that has not grown brambles for three years, and preventing the plants becoming injured during cultivation.

BUSH FRUITS

THIS term is commonly used to cover currants and gooseberries. The plants are relatively hardy, but, unfortunately, the yellow currant fly and leaf spot diseases have been handicaps to their successful culture. Prospects are bright for overcoming these pests completely by the timely application of early season poison sprays.

The red, white and black currants are mostly of European blood. The clove currant is native to our own southwest prairies. The gooseberry varieties on the approved local fruit list are predominantly of American breeding. Some carry an admixture of the European, and a few are pure European. These last tend to lack hardness and to be subject to some damage from mildew disease.

All of these fruits are esteemed in making jelly, jam and conserves. Gooseberries are especially valued for pies. The black currant has remarkably high vitamin C content, being as much as five times as potent in this important vitamin as are oranges and grapefruit. Once again, Grandmother is proven to have been strong in wisdom when she brought a jar of black currants from the fruit cellar whenever winter illness threatened the family.

RED CURRANTS

CASCADE

Cascade named by the Minnesota Fruit Breeding Farm in 1942. It originated as an open-pollinated seedling of Diplomat. Compared with its sister, Red Lake, the bush is less erect, the fruit ripens nearly a week earlier, the berry is larger but the clusters are shorter. This variety is doing very well in many prairie gardens.



FIGURE 1. Red currants ready for harvest.

Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario.



FIGURE 15. Black currant - a fruit

*Courtesy of the Division of Horticulture, Central
Experimental Farm, Ottawa, Ontario.*

DIPLOMA

Diploma originated by Jacob Moore, Brighton, New York, in 1884 from the cross, Cherry x White Grape. The plant is of medium vigour, erect, hardy and moderately productive. Fruit is large, light red, sweet and mild.

PRINCE ALBERT

Prince Albert is an old European variety. The fruit is large, very late, and highly flavoured. The bush is hardy and more resistant to leaf diseases than some other varieties.

RED LAKE

Red Lake was named at the Minnesota Fruit Breeding Farm in 1933. The parentage of this valuable seedling is not known. The bush is of medium growth, erect, hardy and productive. Berries are large, light red, late, mildly acid, and of very good quality.

STEPHENS

(Stephens No. 9) originated from unknown parentage with C. L. Stephens, Orilla, Ontario. The variety was distributed by the Central Experimental Farm, Ottawa, Ontario. Bush is moderately vigorous, upright, hardy, tough in fibre, and productive. Berries are large, borne in long bunches, and of very good quality.

WHITE CURRANTS

WHITE GRAPE

White Grape is of European origin. The bush is of medium vigour and very productive. Berries are of medium size and sweet. This and other white varieties, as Large White and White Imperial, are relished as dessert fruit.

BLACK CURRANTS

BOSSHOOP GIANT

Boschoop Giant came from Holland. Bush is a strong grower, moderate in hardiness and yield. Berries are large, round, black, mid-season, sweet, aromatic and of highest quality.

BUDENBERG

Buddenberg imported to Canada from England. Bush is vigorous, upright, hardy and productive. Berries are large, round, subacid, and of very good quality.

CLIMAX

Climax introduced by the Central Experimental Farm, Ottawa, Ontario, in 1887. It is a seedling of Naples. Bush is vigorous, very hardy and productive. Fruit is medium to large, bristly subacid and of pleasing flavour.

KERRY

Kerry is a twin sister of Climax. Bush is vigorous, erect, and very productive. Berries are medium to large, bristly subacid, and of good quality when canned. This is proving a valuable variety for prairie gardens.

CLOVE CURRANTS

(Golden Currant, or Missouri Flowering Currant)

CRANDALL

The origin is uncertain. It probably arose as a selection in the wilds. Bushes grow as high as eight feet, are vigorous, very hardy, suckering, ornamental, and productive when planted beside another strain of the same species to effect cross-pollination. Fruit is very large but variable in size and in time of ripening, black, glossy, roundish, sprightly, very aromatic, valued for making pies. This type of currant is able to withstand hot dry weather very much better than the commercial types of currants. Clove currants are native to the southwestern Canadian prairies.

GOOSEBERRIES

ABUNDANCE

Abundance introduced by the North Dakota Agricultural College, Fargo, North Dakota in 1912. Parents are Oregon Champion, a native gooseberry of the Red River Valley, *Ribes cuneatum*. Bush is a strong grower, more thorny than Pixwell, hardy and enormously productive. Fruit is medium size, round, borne on long stems, purplish when ripe, skin is thick and tough, quality good for canning.

CHARLES

Charles introduced by the Central Experimental Farm, Ottawa, Ontario about 1917. Parents are Houghton's Roaring Lion. Bush is a moderate grower of medium hardiness, spreading, many strong thorns, productive. Fruit is medium large, oval, green tinged with red and of good canning quality.

CLARK

Clark originated with M. C. Smith, Burlington, Ontario. It is probably a seedling of Downing or Pearl. Bush is moderately vigorous, tender but one of the hardier large fruited varieties, productive. Fruit is very large, greenish yellow turning reddish when mellow ripe, late to good quality. This is a leading commercial variety over much of Ontario.

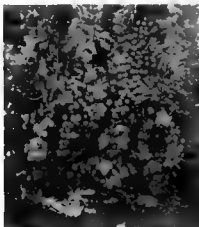


FIGURE 1.—A very productive gooseberry seedling.

—Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario.

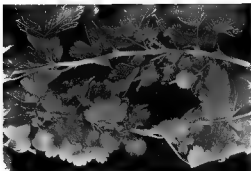


FIGURE 12. A spineless gooseberry seedling selection.

-Courtesy of the Division of Horticulture, Central Experimental Farm, Ottawa, Ontario

OREGON

'Oregon Champion' developed in Oregon by Dr. P. Pettyman, about 1880 from the cross Crown Bob x Houghton. Bush is a moderate grower, numerous weak thorns, healthy, nearly hardy, very productive. Fruit is medium in size, green when ripe, round oval, covered with light down, mild in flavour.

PURCELL

Purcell is twin sister of Abundance. Bush is very growthy, canes slender, tending to droop with age, thorns few but strong, hardy and productive. Berries are medium size, pink when ripe, borne on long stems which permit ease of picking, thin skin, quality good for jelly, pies, preserves and sauce. This variety is being widely grown in prairie gardens.

ROSS

'Davidson' a large fruited variety of uncertain origin that was distributed by Norman M. Ross of Indian Head, Saskatchewan. It resembles Clark but the bush is more vigorous and probably somewhat hardier. Berries are large, yellowish green when fully ripe, and of good quality. This seems the best adapted to Saskatchewan conditions of all the large European types. It has been growing at Indian Head since 1908.

THORESON

Thoreson is said to have been imported from Hungary. It was named and distributed by W. J. Boughey, Valley River, Manitoba. Bush a moderate grower, few thorns, very hardy, productive. Berries are of medium size, green, and of good quality. This seems to be practically identical with the variety introduced under the name of Pambona Pride by J. J. Friesen of Morden, Manitoba.

FIELD MANAGEMENT AND CULTURAL METHODS

SITE

As these bush fruits prefer cool moist conditions, a northern slope is favourable. Currants and gooseberries bloom very early in the spring. In some seasons, injury from late frosts destroys the blossoms. This is the case particularly with black currants. A northerly or easterly slope that is shaded on the south and west tends to delay blooming. The slope also tends to drain off frosty night air to the lower land. In the absence of sloping land, it may be best to choose a situation on the north side of a hedge or belt of trees or set of buildings. If set in a low spot frost damage to blossoms is likely to occur occasionally. It is convenient sometimes to plant a line of bush fruits between two rows of tree fruits in the orchard.

SOIL

All currants and gooseberries enjoy a fertile, cool soil that is well drained. If the soil reaction be on the acid side rather than alkaline, these bushes do better. There should be an abundance of plant fibre in the soil and no grass or weeds. Clay loam is preferred to sandy land.

PREPARATION

An area that has been in a hoed crop is suitable for planting to bush fruits. In the autumn about forty tons of partly rotted manure is ploughed in deeply. The surface is left rough throughout the winter. When dry in April, it is levelled down with harrows.

DISTANCES

The rows are run six to eight feet apart. Plants are set four, five or six feet apart in the rows. The space is dependent upon the vigour of the variety grown and the system of cultivation to be followed. The Crandall Clove Current requires much space. The rows may well be ten feet apart and the plants six or seven feet.

PLANTING STOCK

Stout well grown one-year plants are preferred. Two-year plants are chosen if the one-year stock is skinny or poorly devel-

oped. Generally first-class nursery stock is available from local nursery firms at small prices. The two-year plants will cost more.

SETTING THE PLANTS

Any broken roots are trimmed off cleanly with a knife or shears. A generous hole is dug. It is very helpful if a bucketful of granular acid sphagnum peat be worked into the moist topsoil that is to refill the hole. The roots are spread out around the hole and the plant set about two inches deeper than it stood when growing in the nursery row. A good plan is to set so that the lowest branch is nicely covered where it joins the main shoots. The earth is packed in firmly with the heel. If the ball of the foot is used, air pockets may remain. The heel wedges these out.

Bush fruits may be planted in April or in early September. Spring planting must be done early as currants and gooseberries are among the very first of the hardy shrubs in breaking their winter dormancy and in leafing out. In southern Manitoba during the first ten days of September is a popular time to plant. That permits root growth to re-establish the plants before cold checks growth. The soil should be moist, or thoroughly irrigated at planting. Young plants are cut back to six inches before the buds break in April. When set in the spring, the plants are cut back as soon as planted.

CULTIVATION

Tillage begins promptly in April. Loosening up the earth permits rain water to enter the soil freely. The cultivator is often used enough to maintain the topsoil in loose condition. As the season advances, the cultivator must run shallowly, as many of the numerous feeder roots grow near the surface.

MANAGEMENT AND FERTILIZERS

Currants and gooseberries are big croppers and heavy feeders. Seldom is the earth too rich for them. Often they suffer because the soil is too lean. The aim is to apply rotted stable manure each year in generous quantity. This is applied in the autumn and cultivated down in the spring. Wood ashes may be worked in to advantage. Application may be up to 1,000 pounds per

acre. The main benefit is expected from the ten tons or more of manure spread annually. A dressing of two bushels per plant is adequate.

Some varieties have arching branches. These may be kept off the ground by supporting the hoop of a nail keg with three or four stakes so that the lower branches rest upon it.

Some growers adopt the practice of spreading a thick layer of strawy manure in the black currant plantation in December. This is to retard the blooming date so that blossom freezing may be avoided or lessened.

PICKING

There is not any rush to pick currants and gooseberries as there is with the more fragrant and perishable strawberries and raspberries. Several pickings are made. Red and white currants are harvested by removing the base of the entire cluster from the bush with the thumb and finger. Black currants may be picked similarly, or individual berries separated. Gooseberries may be stripped off by hand or with the protection of gloves. Care is taken that the fruits be not punctured or ripped by the thorns. As these berries sunscald readily they are placed in the shade promptly. Where the fruit is for jelly making, the berries are picked while slightly on the green side. Currants may remain in condition on the bush for a month after ripening.

YIELD

Red currants should give from 3,000 to 5,000 quarts per acre. Whites may be somewhat less and blacks considerably less. Hardy gooseberries may give over 6,000 quarts. European types are less fruitful but are most esteemed because of their sweetness and fine flavour.

DURATION

Bush fruit plantations may be profitable for at least twenty years. The period depends upon the care given in keeping the soil enriched, the plants pruned regularly and the plantation kept free from serious outbreaks of diseases and insects. The planting should give at least ten satisfactory crops before lack of thriftiness indicates need of replacement.

IRRIGATION

Irrigation is not applied in most areas. However, where facilities for watering exist it will be advantageous to undertake surface watering in dry spells in midsummer and in mid-October. The native clove currant, as represented by the variety Crandall, does exceptionally well even in warm dry seasons.

PRUNING

Pruning is essential to achieve satisfactory crops. The work is done in late autumn after the wood has hardened up and been subjected to a few night frosts. November to early December is the common time. Pruning is done with the understanding that most and the best fruit on black currants is borne along the

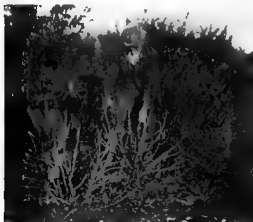


FIG. 1. Currant bushes in the International Horticultural Station, Morden, Manitoba, in October. Here, black currants are planted as a between-row crop in the orchard.

sides of one-year shoots, while on red and white currants it is mostly on spurs of two- and three-year branches. Gooseberries have a combination of the two currant types. The spurs on red currants and gooseberries are short branchlets with numerous buds. They usually carry a cluster of leaves. In currants and

gooseberries all wood three years of age is cut out. Older wood tends to produce inferior berries and few of them.

In pruning black currants the object is to have a plentiful supply of young wood. Some growers cut out wood that is two years old. Others leave two or three of these branches. Red and white currants and gooseberries are pruned to leave three canes of this year's growth, three of one-year wood, three of two-year wood, and three of three-year wood. The last three will be removed next autumn and three strong well situated young shoots retained to replace them. Vigorous young shoots of red currants may be shortened to keep the bush shapely and to induce a growth of spurs evenly along the stem. Black currants are not cut back.

WINTER PROTECTION

These bush fruits are relatively hardy and are seldom given protection. Where snow drifts form, it may pay to tie the branches up in a 'teepee' with twine. This is to avoid breakage and prostrate branches. With tender large fruited gooseberries, the bushes may be covered with strawy manure, or some of the branches covered with litter to hold them down on the soil until mid-April. Like other small fruits, these bush fruits deserve and should have the protection of a surrounding tree shelterbelt.

PROPAGATION

Red, white and black currants and most American varieties of gooseberries are readily grown from cuttings. Other gooseberries are layered. Currant layers develop roots quickly and this is a sure way to increase a favourite variety. The clove currants are reproduced from sucker growths.

Cuttings are made in October or November from stout wood of the present season growth. The lower cut is horizontal close to the bottom of a bud. The upper cut is about nine inches up and is made sloping about one half of an inch above a bud. The lower cut is made to induce early callusing and rooting. The upper cut in such manner that the highest bud will not dry out. The cuttings are tied in bundles of about twenty-five and buried upside down in damp, but not very moist, soil in a box or nail keg in a cool basement or under a foot of soil in a cold frame. The cuttings are inverted so that the bases will get more heat and

air while the top buds are kept dormant. The cuttings are planted in a frame or sheltered nook in early spring. They are set at an angle of forty-five degrees and so deep that only the top sticks out of the soil. They should be kept moist. A mulch of hay or leaves helps keep the soil cool and moist. The following season they are ready for permanent planting.

When only a few new plants are desired, a few branches are bent over and partly covered with earth, the ends being exposed for six inches or more. If layered in spring, the increase should be ready for planting out in one season. Slow rooters are left until the second season.

In mound layering the plant is cut back to about six inches in April. Early in July the clump of vigorous new shoots is filled with moist earth half way up its length. This is packed and kept moist. If acid peat be part of the mounding material, rooting may be strengthened. Next April the rooted layers are set in a nursery row to become stocky. Large fruited gooseberry layers may be best left in the mound for a second year.

PESTS

INSECTS

Three very troublesome insects are likely to appear.

The imported currant worm is a greenish worm with yellowish ends that appears soon after the leaves in spring. It is combatted with poison spray, 1 pound of arsenate of lead powder in 40 gallons of water. Spray may be applied until the berries are half grown, but not later than this. Arsenic is a deadly poison.

The currant aphid is a little green insect that sucks the juices from the underside of the leaves. It is fond of red currant plants. The injury shows in a curling of the upper leaves. Little pockets form. Later the upper surfaces take on a reddish colour. It is important to spray as the buds commence to open, so that the mother aphids be killed. 1 teaspoonful of nicotine sulphate is used in a gallon of soapy water. If later spraying is needed it is applied under pressure to the under side of the leaves.

The yellow currant fly is a small yellowish fly that appears at the time when lilacs come into full bloom. The female punctures the immature fruit and deposits an egg. A red spot develops at the wound. The egg produces a pale larva that hastens the dropping of the fruit. The larva enters the soil to pupate. The following spring it escapes as a mature fly. This pest has become chronic in prairie fruit gardens. A cure has not yet been announced. However, some new spray materials brighten the outlook at the Morden Experimental Station where Dominion entomologists are making extensive researches. Early announcement of effective combat methods is expected. In the meantime it is helpful to allow hens the run of the plantation. Turning over the top two inches of soil under the bushes in late October, to expose the pupae to the weather, has solved the problem with some growers. A new planting on fresh soil may be protected by making an enclosure of fly-screen over the bushes from mid-May until late June.

Diseases

Three foliage diseases are common and injurious. All are of fungus origin.

Leaf spot forms irregular brownish spots with purple rim and pale centre. These may become so numerous that most of the leaves fall in early summer. Spray with Bordeaux 4-4-40 when leaves are unfolding in the spring. Repeat in ten days.

Anthrachnose forms small brownish spots on the upper surfaces of the leaves. Often the disease causes yellowing and early dropping of the leaves. The plants are thus weakened. The Bordeaux applied for leaf spot acts against this also. In addition, a spray of 1 pound of dry lime sulphur in 4 gallons of water should be made as a dormant spray when the buds start to swell.

Powdery mildew may do damage to some kinds of gooseberries in wet seasons. Seldom is it of much consequence on currants. It is seen first as a thin white powdery mass on young leaves. Later it thickens and becomes brown. It may be so severe as to defoliate part of the bush. Sometimes it develops also on young shoots and on the fruit. It is combatted by spraying with fresh lime sulphur powder, 1 gallon to 18 gallons of water.

Three sprayings at twelve day intervals are recommended, the first to be applied as the leaves commence to emerge from the buds.

When poison sprays are required after the fruits have formed the arsenate of lead is replaced by hellbore, used at the rate of 1 ounce to 1 gallon of water, or applied as a dust, 1 part of hellbore to 3 parts of flour or air slaked lime.

It is good policy to spray red and white currant bushes with Bordeaux as soon as the crop is harvested.

BLUEBERRIES

PRACTICALLY no part of the prairie grain belt can grow true blueberries successfully. These belong to the Heath family of plants. They require soil that is distinctly acid in its chemical reaction. The wheat lands of these grassy plains are mostly neutral or somewhat alkaline. Planted here, blueberry plants may stand still, or sulk, for a year or two and then die.

Persons living in the region of pine woods, or areas of sphagnum moss, may wish to cultivate some blueberries. They are directed to Farmers' Bulletin 126, of the Dominion Department of Agriculture, for guidance. The publication may be had upon request from Dominion Experimental Farms.

Two species of blueberries are found in the northern woodlands of Manitoba and Saskatchewan. These are the Lowbush Blueberry (*Vaccinium angustifolium*) and the Canada Blueberry (*V. canadense*). The leaves of the former are glossy on both sides and the fruit, of medium size, is bluish black and covered with a waxy bloom. The leaves of the latter are woolly on both surfaces, the fruit is small, blue in colour and bloomy. Both are esteemed dessert berries.

Eastern nurserymen offer named varieties of commercial blueberries. These carry the blood of the Highbush Blueberry. Tests made in eastern Manitoba show these bushes to be lacking in winter hardiness. For the present, it seems best to have local plantations made with select natives of the lowbush types.

CRANBERRIES

THESE are cousins of the blueberries and also demand acid soil. They are cultivated in acid bogs. Anyone wishing information on their culture is invited to write to the Publications Branch, Department of Agriculture, Ottawa, Ontario, for Farmers Bulletin 46, "The Cranberry Industry". Letters to that address go free, C.H.M.S. The so-called highbush cranberry is not a cranberry but a *Viburnum*. The fruit is a drupe with a bony pit. Further comment is found under "Pembinas".

SWEETBERRY HONEYSUCKLE

A low honeysuckle that grows in the north woods bears blue edible berries that are suggestive of the blueberry in flavour. They make an acceptable substitute. Botanically they are *Lonicera villosa*. The range is from the Riding Mountains northward. Although the wild plants are usually found in moist locations and acid soils, a plantation at the Morden Experimental Station is thriving on loamy soil. They would probably do better if set in pockets of acid peat and given periodic watering. The fruits are sweeter and more pleasing than the Asiatic form which grows taller and has smooth leaves and purple stipules. The leaves of the native are densely woolly on both sides and free of purple tinging.

This fruit is mentioned here as it may have considerable value in home prairie gardens as a blueberry substitute.

PEMBINAS

THIS term is a contraction from two Indian names given to the native shrub commonly referred to as the American cranberry bush, or the highbush cranberry (*Viburnum trilobum*). The two Indian words meant summer-berry, as the bright red fruits, showing up freshly in the depth of winter, reassured the redmen of summer's return.

The Pembina, or cranberry bush, is highly valued as an ornamental shrub. It is beautiful at all seasons. The fruit is gathered by the ton from thickets and used to make jelly and

pies. This plant deserves a few places in the fruit garden. It enjoys moist fertile soil and is wonderfully productive when well tended. There are some selections with fruits that are much superior to the common run of the wilds in size and meatiness. They require a spacing of about eight to twelve feet.

Where bushes are transplanted from the woods, they are moved in April. Effort is made to move them with a large ball of earth. If such is accomplished, the stems are headed back to about twelve inches. If moved with little or no earth, the stems are cut off within three inches of the ground. This seems essential to get the plant re-established. Well rooted plants from the nursery transplant much more favourably than forest-dug stock.

SASKATOONS

THIS is another attractive native shrub that bears tasty, useful fruit. The name is Indian and is applied to the bush, or little tree, *Amelanchier alnifolia*. There are a number of common names including Saskatoon Serviceberry, Serviceberry, Juneberry, Shadblov and Shadbush. The berries are eaten fresh and cooked in various ways, including combination with rhubarb and other acid fruits. The usual colour is dark purple or black with a grey bloomy covering. Some bushes bear red fruits, and some are white. The latter are sweeter but need to be eaten promptly as any bruises soon become discoloured and unsightly.

The Saskatoon resembles the Peambuna in doing better under cultivation, liking moist friable mellow soil, and requiring special treatment in transplanting. Plants moved from the thickets are cut off close to the ground when transplanted in April. If not so beheaded, the chances for growing are small.

SILVER BUFFALOBERRY

THIS native shrub, *Shepherdia argentea*, is mostly employed as an ornamental on the grounds or as a clipped hedge. In a few fruit gardens it is grown for its berries, which are used to make jelly and to a less extent for pies and preserves. The fruits cling to the bush well into winter.

An important consideration is that the bush is unisexual, only one sex being developed on each specimen. Commonly one staminate or male tree is planted for every four or five pistillate or female trees. The plants produce suckers. Making increase from these, the desired ratio of fruit bearing plants may be arranged.

This plant does well in sandy and or other types of well drained soil. It tolerates dry conditions better than most shrubs. Ordinary care and moderate heading back is involved in its transplanting. When suckers are planted they should be cut back to about six inches.

AMERICAN ELDER

THE fruit of the American Elder is popular with some people for pies, juice and wine. The shrub is native as far as southeastern Manitoba. This local strain and an early ripening form from Nova Scotia have been doing well in southern Manitoba and at Brooks, Alberta. Some strains from Eastern Canada have been more or less tender. Furthermore, some of the tender strains are so late in ripening that fruits may be ruined by autumn frosts.

Plants are increased from suckers, cuttings or seed. Transplanting is done early in spring. The tops are cut back six to twelve inches. Spacing is about eight to twelve feet.

RUSSIAN MULBERRIES

COMMERCIAL mulberries have been disappointing on the prairies due to their lack of hardiness. Strains of the White Mulberry received from the dry steppes of Russia, in pleasing contrast, have been thrifty and productive in southern Manitoba and central Alberta. Plantings made near strawberry patches and early cherry trees have helped keep robins, catbirds and waxwings away from these fruits. The berries are mostly purplish violet, or purplish red and the shape is suggestive of a slim elongated blackberry. The seeds are tiny. The flesh is soft, sweet and rather unacid. Fruits ripen unevenly over a period of weeks, commencing in early midsummer.

The round headed bushes leaf out late in May, and sometimes reach a height of about fifteen to twenty feet. A source of interest

is the wide diversity of foliage. A single plant may be clothed with leaves of many dozen different shapes.

The black mulberries and red mulberries which are more highly prized for their fruits have proven tender in local trials.

HAZEL (Filbert)

TWO kinds of hazel grow in the moist thickets of Manitoba and Saskatchewan. The American Hazel, *Corylus americana*, has a frilled involucre or sheaf covering the nut. The bush may reach nine feet. The nuts develop in clusters of from two to six. The Beaked Hazel, *C. cornuta*, has a long tubular involucre which extends as a narrowed cylinder past the end of the oval shaped nut. The nut of the American Hazel is almost round.

The fruits of these two hazels vary considerably in size, thickness of shell and in yield. Some superior strains have been selected. These are worthy of cultivating in the garden. Transplanting is a somewhat delicate operation. It should be done early in April and with a maximum amount of moist roots. Heading back is to be severe as the plants may not get started where long stems are left on and have to be fed by the remaining roots. A chief difficulty in culture is the weevil which infests the nuts. Arsenate of lead spraying is done to combat the insects before egg laying takes place.

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ILLUSTRATIONS

Figure No.	Page
1. Gem, the most widely planted everbearing strawberry on the Canadian prairies	9
2. Strawberry planting stock	11
3. Placing the strawberry plant	12
4. White currants being carried from the field to the packing room	14
5. Strawberry patch mulched with wheat straw in October for winter protection	18
6. A cross-bred red raspberry seedling at promise	22
7. Tip covering raspberry canes in October to prevent winter injury	29
8. Tip covering raspberry canes to prevent drying out and to trap moving snow	30
9. Red currants ready for harvest	34
10. Black currant in fruit	35
11. A very productive gooseberry seedling	57
12. A spineless gooseberry seedling selection	59
13. Pruning red currant bushes	42

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